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10/766,103	01/27/2004	Willie W. Ng	B-4585 619759-6	2200

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EXAMINER

VAN ROY, TOD THOMAS

ART UNIT	PAPER NUMBER
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2828

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/766,103	Applicant(s) NG ET AL.	
	Examiner TOD T. VAN ROY	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-17 and 19-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-16,24,25,31 and 32 is/are allowed.
- 6) ☒ Claim(s) 17,19-23,27,29,35,37,39 and 40 is/are rejected.
- 7) ☒ Claim(s) 26,28,30,34,36 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The Examiner acknowledges the addition of claims 40 and 41.

Response to Arguments

Applicant's arguments, see Remarks, filed 10/29/2009, with respect to claims 28, 30, 34, 36 and 38 have been fully considered and are persuasive. The rejection of the claims has been withdrawn.

The Examiner notes agreement with the Applicant's position regarding the selection of materials for both the laser *and* etalon, as well as the selection of a single peak from the Bragg reflectivity spectrum (Waarts appears to use multiple frequency output).

Applicant's arguments filed 10/29/2009 have been fully considered but they are not persuasive.

*With respect to **claim 17**, the Applicant has argued that Waarts does not teach a tunable etalon.*

The Examiner does not agree. Waarts at [0034] states: "The central frequency of Fe of the EC laser spectrum is approximately equal to the optical frequency Fe of the maximum etalon transmission, and can be tuned within the reflection bandwidth of the Bragg grating by changing the angular orientation of the Fabry-Perot etalon". This equates to shifting (tuning) the peaks 210/220/230 of fig.2 to match up with different portions of the Bragg spectrum "d". Therefore, the etalon is tunable.

The Applicant has further argued Waarts does not teach “grating fabricated in a silica waveguide for reflection back to said gain element” (emphasis added).

The Examiner notes [0029] which states the extended cavity of the laser device is formed via the back facet (fig.1 #105) and the Bragg reflector (fig.1 #150). Reflection from the Bragg grating to the gain element must occur to have a properly formed cavity. Further, [0034] states that reflection from the frequency selective reflector (fig.1 #10, made up by the etalon and Bragg reflector) returns to the diode #100.

The Applicant has argued that light cannot return to the gain medium as the etalon does not allow for back reflection.

The Examiner notes the cited paragraphs ([0029, 34]) which state that the feedback to the gain element does in fact occur. The prevention of back reflection from the etalon referred to in [0031] is mentioned as the etalon is not a cavity reflector. The etalon acts as a transmissive filter. As the cavity is formed from the gain element back facet to the Bragg reflector, any spurious reflection from the etalon would create instabilities in the system. The fact that the etalon is not reflective does not mean that light is not returned to the gain medium as discussed above.

The Applicant has argued that the combination of Waarts with Daiber is not obvious as Waarts is not teaching a tunable etalon.

The Examiner points to the above discussion wherein it is established that Waarts does teach a tunable etalon, making the combination reasonable.

The Applicant has argued that the combination of Waarts and Diaber with Kim is not obvious as a wide tuning range provided by Kim does not fit into a non-tuning system like that of Waarts.

The Examiner points to the above discussion wherein it is established that Waarts does teach a tunable etalon, making the combination reasonable.

*With respect to **claim 19**, the Applicant has argued that Waarts does not teach Vernier tuning, nor is Vernier tuning mentioned in the disclosure.*

The Examiner pointed to the figures to demonstrate that alignment and overlap of the different filtering bandwidths allows for selection of the desired frequency range. This alignment, via tuning [0034], is believed to be the same Vernier type used by the Applicant (see the instant specification [0051] and fig.11. The Examiner further notes that Waarts need not use the term “Vernier” in the disclosure if the method itself is outlined therein.

*With respect to **claim 27**, the Applicant has argued that the selection of the materials is not automatically obvious.*

The Examiner notes [0047-48] of Waarts which first outlines a specific material example and then states that “the laser diode chip 100 can be a semiconductor laser chip of any known type capable of generating optical power in excess of 0.1-1W in a single spatial mode”. Further, additional material examples such as GaN, InP and GaAs are given in [0048]. The selection of GaInAsP/InP for the chip is therefor believed obvious as the selection of an alternate material was suggested by Waarts, and would allow for production of alternate frequency ranges.

*The Applicant has argued **claims 29 and 33** similar to that described above.*

The Examiner responds in kind with the explanation provided above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 17, 19-23, 27, 29, 35, 37, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waarts et al. (US 2004/0131093) in view of Daiber (US 6816516) and Kim (US 2004/0264514).

With respect to claim 17, Waarts teaches a method of configuring a transmitter to transmit one of a plurality of wavelengths (abstract), said method comprising the steps of: passing a spectrum of light from a gain element (fig.1 #100) into a tunable Fabry-Perot etalon (fig.1 #135 angle tuned), selecting a first portion of said spectrum of light to be transmitted by said transmitter (first output prior to tuning operation); and tuning said

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tunable Fabry-Perot etalon ([0034]), wherein a second portion of said spectrum of light (new portion after tuning) is transmitted to a grating (fig.1 #150) fabricated in a silica waveguide ([0046]) for reflection back to said gain element (fig.1 #148). Waarts does not teach the etalon to be electrically tuned, or the grating to be sampled. Daiber teaches a similar external cavity laser using an electrically tunable etalon (fig.1). Kim teaches a similar external cavity laser using a sampled grating formed in a waveguide (fig.1). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the angle tuned etalon of Waarts with the electrically tunable etalon of Daiber as a matter of engineering design choice allowing for an alternate method to complete an identical function which allows for alignment simplification of the optical elements. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the system of Waarts and Daiber with the sampled grating type of Kim in order to utilize a reflection spectrum which allows for a wide tuning range.

With respect to claim 19, Waarts further teaches Vernier tuning (aligning the reflection peaks, figs.2-4).

With respect to claim 20, Waarts further teaches the step of selecting a first portion further comprises the step of coupling a fixed optical grating (fig.1 #150) to said tunable Fabry-Perot etalon (fig.1 #135).

With respect to claim 21, Kim further teaches the grating is UV-induced (fig.3).

With respect to claim 22, Waarts further teaches said spectrum of light corresponds to predetermined frequencies set according to an international standard (980nm standard, [0047]).

With respect to claim 27, Waarts teaches the claimed invention, including the gain material to be an amplifier of light (function of laser active region) and the use of GaAs/InGaAs material ([0047]), but does not teach the use of GaInAsP/InP material for the gain media. These materials are known in the art to be used with lasers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the laser of these known materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Claim 29 is rejected for the same reasons given in the rejection of claims 17 and 27 above.

Claim 33 is rejected for the same reasons outlined in the rejection of claim 17 above.

With respect to claims 35, 37, and 39, Waarts further teaches the gain element is a semiconductor optical amplifier (function of gain layer in a laser to amplify light).

Claim 40 is rejected for the same reasons outlined in the rejections of claims 17 and 19 above, further noting the sampled grating of Kim provides individual reflection peaks (Kim, fig.4) and the tuning of Waarts shifts the etalon spectrum over at least one wavelength (a number) of the Bragg spectrum ([0034] or no tuning would occur).

Allowable Subject Matter

Claims 1, 3-16, 24-25, and 31-32 are allowed.

Claims 26, 28, 30, 34, 36, and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tod T Van Roy/
Examiner, Art Unit 2828